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Observations on the Camel's Stomach respecting the Water it contains, and the Reservoirs, in which that Fluid is inclosed; with an Account of some Peculiarities in the Urine. By Everard Home, Esq. F.R.S. Read June 12, 1806. [Phil. Trans. 1806, p. 357.]

The camel, on which Mr. Home's observations were made, was a female, twenty-eight years old, and was brought from Arabia. It drank regularly, every second day, six gallons of water, sometimes seven and a half; but would not drink in the intervening period. It daily consumed a peck of oats, one of chaff, and one third of a truss of hay. It was killed on the first of April last, by thrusting a double-edged poniard between the skull and the first vertebra of the neck; it had a few hours before drank three gallons of water.

A very particular account of the animal's various stomachs, and of those of the bullock, together with the mode in which the food successively passes into them, is now given. From these (which our limits necessarily oblige us to omit,) it appears, that in the bullock there are three stomachs for the preparation of the food, and one for its digestion; whereas, in the camel, there is one stomach that answers the purpose of the two first of the bullock, a second employed merely as a reservoir for water, a third so small and simple in the structure of its internal membrane, that it can answer no purpose except that of retarding the progress of the food, and making it pass into the fourth stomach by small portions (for as it is not lined with a cuticle, it cannot be compared to any of the preparatory stomachs of the bullock), and a fourth, or true digesting stomach.

It appears, from our author's examination, that the camel, when it drinks, conducts the water in a pure state into the second stomach; that part of it is retained there, and the rest runs over into the first stomach, acquiring a yellow colour in its course. This purity of the water in the second stomach is a well-known fact; but by what means the water was kept separate from the food, had never been explained; nor had any other part been discovered by which the common offices of a second stomach could be performed. For Mr. Home's explanation of the mode in which the former is effected, we must refer to the paper itself, and especially to the figures of the parts with which it is accompanied.

From the facts stated by our author, the following gradation of ruminating stomachs is established by him.

Those ruminants which have horns, as the bullock, sheep, &c., have two preparatory stomachs for the food previous to rumination, and one for the food to be received in after rumination.

The ruminants that have no horns, as the camel, dromedary, llama, &c., have one preparatory stomach for the food before rumination, but none in which it can be properly said to be afterwards retained, before it passes into the digesting stomach.

Those animals that eat the same kind of food as the ruminants, but do not ruminate, as the horse and ass, have only one stomach; but a part of it is lined with a cuticle: in this part the food is first

deposited, and by remaining there some time, is more easily digested when it passes to the second, or digesting portion.

The difference, with respect to the teeth, between those animals which ruminate, and those which (although they eat nearly the same kind of food,) do not ruminate, is, according to our author, as follows.

Ruminants that are furnished with horns have molares, or grinding-teeth, in both jaws, and incisors only in the lower jaw.

Ruminants that are without horns have, besides the above, what may be called tusks, or fighting teeth; but these are of no use in eating. The *Camelopardalis* forms an intermediate link between the two, as it has short horns and no tusks.

Annexed to Mr. Home's paper, is an account of some experiments made on the urine of the Camel, by Mr. Brande.

The result of his experiments gives the component parts as follows; but it must be observed, that the quantity he had to operate upon was so small, that his analysis must be considered merely as an approximation to the truth.

Water.....	75
Phosphate of lime, muriate of ammonia, sulphate of } potash, urate of potash	6
Muriate of potash	8
Urea	6
	<hr/> 95

Observations on the Variation, and on the Dip of the magnetic Needle, made at the Apartments of the Royal Society, between the Years 1786 and 1805 inclusive. By Mr. George Gilpin. Communicated by Henry Cavendish, Esq. F.R.S. Read June 19, 1806. [Phil. Trans. 1806, p. 385.]

The instruments with which Mr. Gilpin's observations on the variation, and on the dip of the magnetic needle were made, are the same as were used in former observations, and are described by Mr. Cavendish, in a paper printed in the 66th volume of the Philosophical Transactions. But as the observations now communicated by Mr. Gilpin are the first that have been given since the compass was put up in the Society's Apartments in Somerset Place, he has thought proper to describe very particularly its situation in the house, at the time the observations were made, and also the method he pursued to ascertain what allowances were proper to be made in the results of his observations.

After stating the circumstances above mentioned, Mr. Gilpin proceeds to the observations. These are detailed in five tables, of which the following is a summary account.

Table 1. contains, in sixteen pages, the observations made on the variation, at various but stated times of the day, from September 1, 1786, to December 31, 1787. It is so disposed, that the increase or decrease of the variation may be seen by mere inspection.